

PAIN MANAGEMENT SERVICE LINE

THE ESSENTIALS OF PAIN MANAGEMENT PROCEDURES

Brought to you by:

Procedural Education Committee of the Pain Management Service Line - Resident and Fellow Section, Society of Interventional Radiology

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TRACHEOBRONCHIAL STENTING

INDICATIONS

1. Treatment of malignant tracheobronchial obstruction.
2. Treatment of post intubation subglottic stenosis that fails endobronchial resection
3. Treatment of benign tracheobronchial stenosis for nonsurgical patients
4. Treatment of localized expiratory airway collapse (e.g. tracheomalacia)

CONTRAINDICATIONS

1. Medically unstable patient unable to tolerate general anesthesia
2. Allergic to stent material
3. Critical airway obstruction
4. Contraindication to bronchoscopy

PREOPERATIVE PREPARATION

1. Review and document clinical history and indication for the procedure
2. Review and document current medications, allergies and coagulation status
3. Review and document vital signs, physical examination, focusing on respiratory system
4. Review the chest CT for imaging correlation and select the stent size (length and diameter) and type (covered or uncovered)
5. The distance from vocal cords to the lesion, the length of the lesion, and the diameter of the lesion is estimated.
6. Stent type is determined based on the disease treated. Silicone stent is commonly used for nonmalignant, long term indications. Uncovered metal stent may be used to promote short-term endothelial growth and healing. Covered metal stent is mainly used for short-term, malignant indications.
7. Antibiotics are not routinely given for infection control and steroids are not routinely given for granulation tissue prevention.

CONSENT

1. Discuss possible procedural complications which may require immediate surgical intervention:
 - a) Stent misplacement
 - b) Bleeding
 - c) Tracheobronchial perforation and pneumothorax
 - d) Retrosternal Pain
 - e) Aspiration
 - f) Hypoxia
 - g) Infection
2. Discuss possible post-procedure complications
 - a) Stent migration
 - b) Stent occlusion due to mucous accumulation, tumor in-growth or granulomatous tissue formation
 - c) Partial stent fractures
 - d) Tracheobronchial wall ulceration, perforation and hemorrhage
3. Discuss possibility of failure of the procedure

PROCEDURE

1. The procedure is performed under bronchoscopic and fluoroscopic guidance under general anesthesia
2. A rigid bronchoscope is used to gain access to the lesion
3. Ablation or dilation of the lesion is performed, if necessary.
4. Sizing of the post-dilation/post-ablation bronchial segment is re-evaluated with balloon or ultrasound. Bronchogram for sizing is not routinely performed.
5. The exact proximal and (if possible) distal margins are visualized
6. A standard 4 or 5 F catheter is advanced over a hydrophilic wire under fluoroscopic guidance, to the level of obstruction

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7. A bronchogram is done using water soluble contrast
 8. The hydrophilic wire is used to cross the level of obstruction
 9. A stiff wire is exchanged through the catheter
 10. The wire is used to guide the stent

POST-OPERATIVE CARE

1. Observe the patient for 1-3 hours in PACU for respiratory complications. Transfer patient to floor if stable
2. Post-op CT or chest X-ray is not routinely performed unless otherwise indicated.
3. Look for signs of airway perforation, i.e. chest pain and new onset dyspnea

POSSIBLE EARLY COMPLICATIONS

1. Stent obstruction by accumulated respiratory secretions or recurrent tumor growth
2. Airway wall perforation or stent rupture from self-expanding metal stents
3. Lower respiratory tract infection

POSSIBLE LATE COMPLICATIONS

1. Stent migration, usually due to violent cough, tumor growth or resolution of extrinsic compression that maintained the stent in position
2. Granulation tissue growth at proximal and distal ends of the stent

FOLLOW UP

1. Repeat CT to confirm stent location and any developing process around it
2. If the patient develops new respiratory symptoms, bronchoscopy should be performed to ensure the airway is patent and stent is in correct position

REFERENCES

1. Inchingolo R, Sabharwal T, Spiliopoulos S, et al. Tracheobronchial stenting for malignant airway disease: long-term outcomes from a single-center study. *Am J Hosp Palliat Care*. 2013;30:683-9.
2. Sanchez JF, Henry C, White HD, et al. Airway Stents: Current Practice and Future Directions. *Current Respiratory Medicine Reviews*, 2014;10:38-43